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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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EXAMINER	
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ART UNIT	PAPER NUMBER
1627	1

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trad marks

Office Action Summary

Application No.	Applicant(s)
09/143,379	Gandhi et al
Examiner	**Art Unit**
T. Wessendorf	1627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 3/5/01

2a) ☐ This action is **FINAL.** 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1-44 is/are pending in the applica

4a) Of the above, claim(s) 1-31 and 39-41 is/are withdrawn from considera

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 32-38 and 42-44 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirem

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☐ Notice of References Cited (PTO-892)

16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____

18) ☐ Interview Summary (PTO-413) Paper No(s). _____

19) ☐ Notice of Informal Patent Application (PTO-152)

20) ☐ Other:

The request filed on 3/5/01 for a Continued Prosecution Application (CPA) under 37 CAR 1.53(d) based on parent Application No. 09/143,379 is acceptable and a CPA has been established. An action on the CPA follows.

Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 119(e) as follows:

> An application in which the benefits of an earlier (provisional) application are desired must contain a specific reference to the prior application(s) in the first sentence of the specification (37 CAR 1.78).

The inadvertent inclusion of claim 40 in the rejections of the claims in the previous Office actions is regretted. Claim 40 depends on the non-elected claim 30. Accordingly, the claims under consideration are elected claims 32-38 and 42-44.

The drawings are objected to because 1). Figure 7 is not on file. 2). The specification describes only a Figure 3 but the drawings contain two figures for said Figure 3. Should applicants amend the drawing to show Fig. 3 as A and B, then the specification should reflect these changes.

This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

Applicants' statement to hold this requirement in abeyance till indication of allowable subject matter is noted.

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 32-38 and 42-44 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific asserted utility or a well established utility.

The specification fails to provide a specific asserted utility for the claimed glycopeptide combinatorial library. The specification at e.g., page 3, lines 5-10 states that "a library could be used to screen for a biological activity of different glycoforms within the library." Screening is not a specific utility. Virtually everything that occurs in nature or a synthetically made compound undergo screening in order to find a useful, specific compound. As stated by the statute above, a patent is granted for any new and useful manufacture or composition of matter. However, a library is nothing more than a collection or mixtures of known or existing products that can not

be categorized as new and has to be screened to discover a new compound or composition contained therein. As stated above, a collection (library) of compounds does not have a utility per se. Hence, the two requirements of the above statute have not been met. The collection is analogous to a composite material present in nature in its unisolated, unpurified state or form by which one cannot ascertain the composition or compound present therein until the compound with specific utility has been successfully isolated, separated and identified. A patent application is a not a hunting license rather, a reward for the successful accomplishments of a search. An assessment that focuses on whether an invention is useful only in a research setting thus does not address whether the specific invention is in fact "useful" in a patent sense. A collection or mixture of different compounds does not have a specifically identified utility, rather an invention whose specific utility requires "intermediate" or "for research purposes" which are not helpful in determining if applicants have identified a specific utility for the claimed collection or library. (See MPEP 2107)

Claims 32-38 and 42-44 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific asserted utility or a well established utility for the reasons set forth above,

one skilled in the art clearly would not know how to use the claimed invention.

See the 101 rejection, above.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 32-38 and 42-44 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

A). The recited "antibody" activity is not supported in the as-filed specification. The as-filed specification at e.g., page 4, line 20 describes a compound that only resembles or has an antibody-like property. For example, the compound appears to be a modified one that mimics an antibody activity.

B). The specification fails to provide an adequate description of the components of a library that has competitive inhibitory, immunostimulatory or antibody activity. The

specification provides a generalized statement as broad as the claimed invention. The components of the library are merely recited to be a glycopeptide without defining the structure. Without defining the structure, the glycopeptide comprises every conceivable possible combinations of diverse structures defined only by the different opposite functions such as inhibition, immune stimulation or antibody activity.

Furthermore, the specification does not adequately describe a carbohydrate structure that function as adhesion ligands for bacterial receptors expressed on human cell surface antigens.

Claims 32-38 and 42-44 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for mucin 1(MUC1) as the core protein and inhibitory activity for a compound in the library, does not reasonably provide enablement for the broadly recited combinatorially-generated library of glycopeptides. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The scope of enabling disclosure provided in the specification is not commensurate with the broad claimed library of glycopeptides. The specification merely provides general statement as to the components that can comprise the glycopeptide

library. However, the examples provided therein is merely drawn to a single glycopeptide i.e., MUC1 as the core protein to which a random glycosyl components can be attached. No other core or scaffold protein to which any library of glycosyls can be attached. More importantly, there is no screening method that identifies each of the different functions that is supposedly possessed or can be achieved by the library. Furthermore, the examples specifically describe a specific type of glycopeptide library that employs a specific type of assays for the glycopeptide inhibitory activity. As stated by applicants at page 5 of the instant REMARKS. "...being large in size and length, the glycosylations extend far out on the epithelial cell surface and become the foremost contact points for a variety of functional molecules, antibodies, immune cells and even for infections by pathogens like bacterial. In order to design competitive inhibitors and antigens, it is important to know the sites of glycosylations as well as the nature and size of the carbohydrates at each site. If one considers the permutations and combinations that arise from all the unique sites and the variety of carbohydrates that may exist on the tandem repeat, the number of possible arrangements becomes unimaginably large, combinatorial and random techniques result in all of the statistically possible ways in which various reactants can

combine without actually identifying any of them until a screening process detects a "hit" for further analysis and identification. Accordingly, to extrapolate the single embodied species of a glycopeptide library to the myriads of libraries that the claims encompass including lipid containing glycopeptides would entail undue amount of experimentation. A skilled in the art would be faced with numerous unpredictable factors such as the components of a carbohydrate and/or peptide can be comprised in a library, the site or amino acid in the peptide that can be modified by attachment of the carbohydrate moieties singly, or in combinations with other components as lipids, the means of attachment, the type of library that the carbohydrate can assume e.g., random or biased, the type of assays that determines either a single or all activities present in the library. Such determination for the practice of the instant invention is undue experimentation. Ex parte Forman, 230 USPQ 546, BPAI, 1986

Claims 32-38 and 42-44 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The description of a library based on the method by which it is made fails to identify the structural components present in

the library i.e., it fails to fingerprint the library. This is made more confusing for failing to recite the metes and bound of the carbohydrate structures associated with mucins or the carbohydrate structures with the recited function. It is not clear within the claimed context, in what aspects the carbohydrate structures are associated with human cancer-associated mucins. E.g., claim 32.

Claim 38 is confusing as to the method steps of identifying a biologically-active compound. It is not clear whether a method of making a library or a screening method is desired. Furthermore, the preamble of the claim does not correspond with the body of the claim since no biologically-active compound is recited. Rather, only screening for the different functions of a library. It is not clear as to the screening method by which a library is identified for each of the recited functions.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more

> than one year prior to the date of application for patent in the United States.
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 32, 34-38 and 42-43 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Rao et al (5,795,958)for reasons advanced in the last Office action (12/6/99), pages 5-6.

Applicants admit that Rao discloses a collection or library of glycopeptide. Nevertheless, argue that Rao (col. 3, lines 15-17) discloses that each glycopeptide is individually synthesized using a multicolumn automated peptide synthesizer by sequentially coupling individual amino acids including pre-fucosylated serine and subsequently combined to form a collection of library. There is nothing that differentiates this library from the instant random library of glycopeptides. The steps recited in the claims of preparing the library of glycopeptide by randomly reacting a peptide scaffold with a carbohydrase structures that function as

adhesion ligands for bacterial receptors is the same random library of Rao. See e.g., col. 7, line 60 to col. 8, line 11. Thus, whether the library of Rao is produced by sequential coupling of individual amino acids as opposed to the instant random reaction (which Rao also discloses) and might be a long, tedious process however, the same product i.e., combinatorial library of glycopeptides is obtained by Rao as that instantly claimed. Applicants' further arguments as to the differences in size and diversity of the instant library from the glycopeptide library of Rao is not commensurate in scope with the claims. The claims do not recite for a library size or any diversity in the library. Contrary to applicants' arguments, Rao discloses at e.g., col. 21, lines 44-49 not only variations in the amino acid residues but also variations in the multiple carbohydrate residues of the peptide derivatives. The carbohydrate residues that can be varied include N-acetylgalactosamine, inter alia. As applicants stated in their REMARKS the true glycosylation pattern of a mucin tandem repeat can only be discovered through a combinatorial approach i.e., by randomly glycosylating and generating a near true diversity to enhance the possibility of locating a tandem repeat that has a glycosylation pattern similar to that of a mucin. The single most powerful benefit of having all random combinations is the ability to locate a glycopeptide

with be right glycosylation pattern that is characteristic of a cancer-associated mucin.

Accordingly, from applicants' arguments, the crux of the invention lies in identifying the glycosylation site of a known glycopeptide library with a random glycosyl residues.

Claims 32 and 34-38 are rejected under 35 U.S.C. 102(b) as anticipated or, in the alternative, under 35 U.S.C. 103(a) as obvious over Vetter et al (WO 95/18971) for reasons set forth in the last Office action, page 6, last paragraph.

Applicants admit that Vetter (page 25) describes a combinatorial aspect with amino acid variations in the peptide sequence, except for the O-allyl protected aspartic acid, which remains constant as the sole glycosyl acceptor. Nevertheless, argue that the library carries a single carbohydrate structure with no provision for further iterative synthesis leading to one more complex structures, as in the randomly glycosylated libraries according to applicants' invention. Vetter discloses at e.g., page 26, lines 19-31 a first set of resin bound glycosylated library of glycoconjugates (introduced to the various aliquot of resin beads containing surface reactive functionality. The aliquot of the original 184 member library were diversified by conjugation to 17 different glycosylamines, inter alia, NGal). See further the response under Rao, supra

regarding applicants' arguments as to the process by which the product is made.

Claims 32 and 34-38 are rejected under 35 U.S.C. 102(a) as anticipated or, in the alternative, under 35 U.S.C. 103(a) as obvious over Schleyer et al (Angew. Chem. Int.).

The broadly claimed randomly-generated glycopeptide library is anticipated or obvious over the glycopeptide library of Schleyer. Furthermore, Schleyer discloses a library of glycosylated platforms(i.e., peptide)using the glycosyl residue at e.g., page 1976, col. 1. See In re Marosi or Thorpe, above. Since the instant specification (page 1, first sentence) does not contain a specific reference as claiming priority to the provisional application(s) hence, applicants are not accorded the benefit of the provisional application filing date.

Claims 32-37 are rejected under 35 U.S.C. 102(b) as anticipated or, in the alternative, under 35 U.S.C. 103(a) as obvious over Frische et al (abstract of J. Pept. Sci.)

Since applicants merely apply the same arguments above hence, the response under Rao and Vetter above is applied herein.

Applicants' further arguments as to the size and diversity produced by the combinatorial libraries as exemplified by MUC3 is noted. However, none of the claims recite for MUC3. Rather, the claims recite for MUC1.

Certain papers related to this application may be submitted to Art Unit 1627 by facsimile transmission. The faxing of such papers must conform with the notices published in the Official Gazette, 1156 O.G. 61 (November 16, 1993) and 1157 O.G. 94 (December 28, 1993)(see 37 C.F.R. 1.6(d)). The official fax telephone numbers of the Group are (703)308-7924. NOTE: If applicant does submit a paper by fax, the original signed copy should be retained by applicant or applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED so as to avoid the processing of duplicate papers in the Office.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to T. Wessendorf whose telephone number is (703) 308-3967. The examiner can normally be reached on Mon. to Fri. from 8:30 to 2:30. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0196.

Tdw

5/18/01

T.D. WESSENDORF
PRIMARY EXAMINER